AMSR-E SWE activities, plans and results

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Outline

- Personnel
- Status of the new algorithm development, implementation and coding
- Results and plans for 2013 - 2014

Personnel

- Full time programmer hired to support the implementation and coding of the new algorithm
- Looking for PhD candidate funded through the AMSR-E/AMSR2 funding. Two potential candidates identified

Quick reminder on the new algorithm

- Provides improved snow depth estimates through the combination of artificial neural network, an electromagnetic physical model and ancillary information
- Uses a new density scheme for generating daily density maps for improving SWE estimates (SWE ~ depth * density)
- Produces effective grain size maps
- Can be upgraded in view of its modular nature

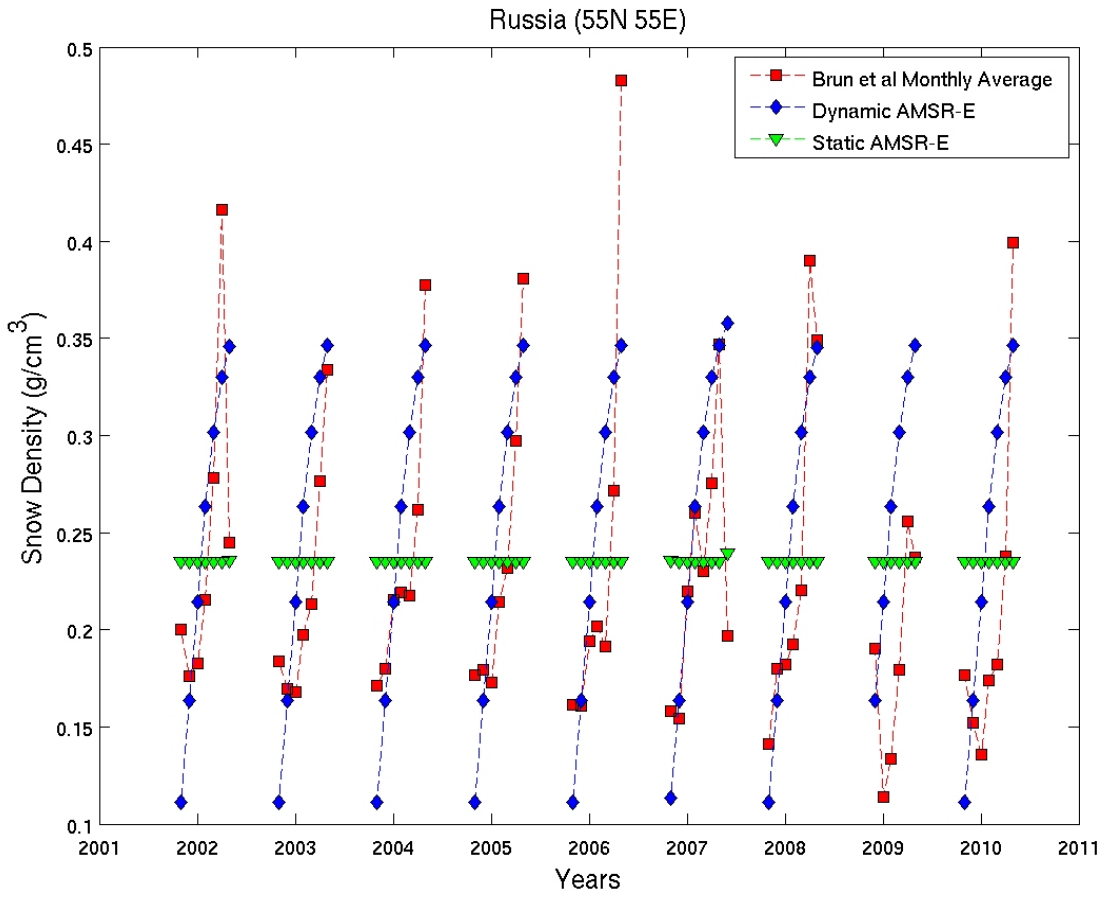
Algorithm development and implementation

- New ATBD delivered to NASA in August 2012. Waiting for comments and approval (?)
- Paper describing the algorithm and its performance to be submitted to the Special Issue 'Cryospheric Remote Sensing', Ed. G. Rees, deadline Nov. 15, 2013
- A beta version of the new 'revised' algorithm for AMSR-E SWE has been coded and implemented into a compatible version to be run at UAH. Waiting to hear for ATBD approval.

Example of results

The figure shows monthly density values obtained for a pixel over Russia with the new scheme (blue diamonds), the values used in the current scheme (green triangles) and the values obtained from an independent study (Brun et al., 2013, red squares).

The improvement of the new scheme over the previous one is evident not only in terms of absolute values but also because the new scheme captures the seasonal variability of snow bulk density.



Brun, E., Vionnet, V., Boone, A., et al. (2013). Simulation of Northern Eurasian Local Snow Depth, Mass, and Density Using a Detailed Snowpack Model and Meteorological Reanalyses. Journal of Hydometeor, 14, 203–219.

Current ongoing activities and future plans

- Generate uncertainty maps as part of the operational output (adding a layer to the product)
- Test the new retrieval scheme for AMSR2
- Continue testing venues for refining the new scheme (e.g., ingesting daily information, EM modeling)
- Evaluate enhanced spatial resolution products for SWE estimates at higher spatial resolution